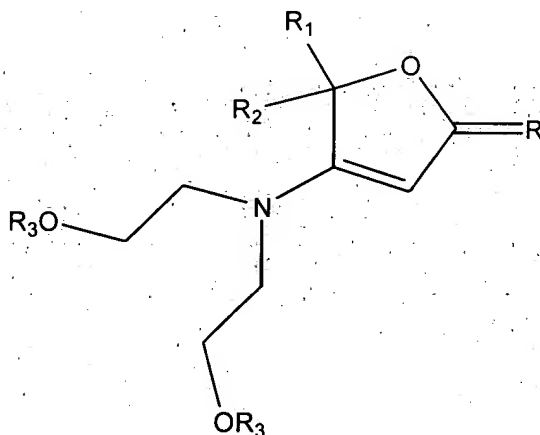


a compound loading of about 25% by weight based on the total weight of polymethylmethacrylate.

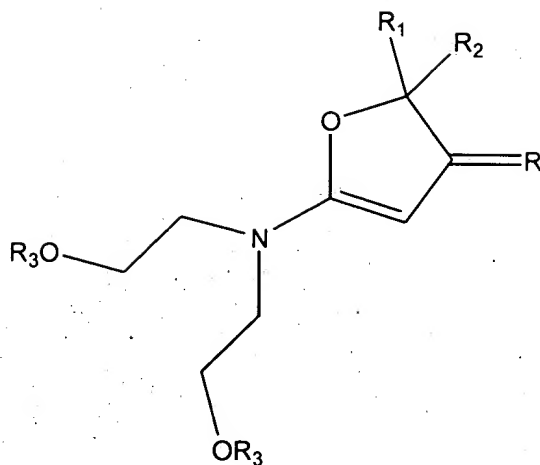
10. (New) The compound of Claim 9, wherein the donor comprises an amino donor.

11. (New) The compound of Claim 9, wherein the donor comprises an amino group conjugated to the polyene through an α,β -unsaturated cyclic ester equivalent having the structure:



wherein R_1 and R_2 are alkyl groups, R_3 is a bulky substituent, and R represents the rest of the compound.

12. (New) The compound of Claim 9, wherein the donor comprises an amino group conjugated to the polyene through an α,β -unsaturated cyclic ether equivalent having the structure:

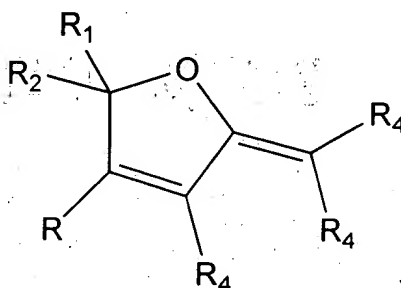


wherein R_1 and R_2 are alkyl groups, R_3 is a bulky substituent, and R represents the rest of the compound.

13. (New) The compound of Claim 9, wherein the donor comprises a bulky substituent to inhibit chromophore aggregation.

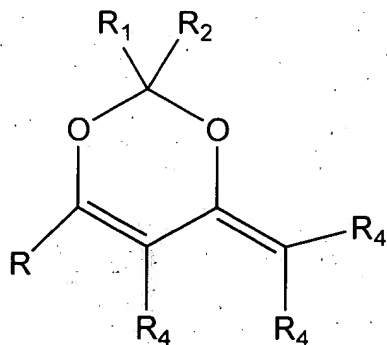
14. (New) The compound of Claim 9, wherein the acceptor comprises a cyanofuran acceptor.

15. (New) The compound of Claim 9, wherein the acceptor comprises a furan group having the structure:



wherein R_1 and R_2 are alkyl groups, R_4 is independently selected from F, CN, CF_3 , and CF_3SO_2 , and R represents the rest of the compound.

16. (New) The compound of Claim 9, wherein the acceptor comprises a furan group having the structure:



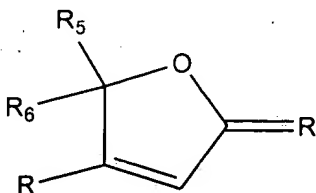
wherein R_1 and R_2 are alkyl groups, R_4 is independently selected from F, CN, CF_3 , and CF_3SO_2 , and R represents the rest of the compound.

17. (New) The compound of Claim 9, wherein the acceptor comprises a bulky substituent to inhibit chromophore aggregation.

18. (New) The compound of Claim 9, wherein the bridge comprises a bulky substituent to inhibit chromophore aggregation.

19. (New) The compound of Claim 9, wherein the π -conjugated polyene bridge comprises a dihydrofuran group.

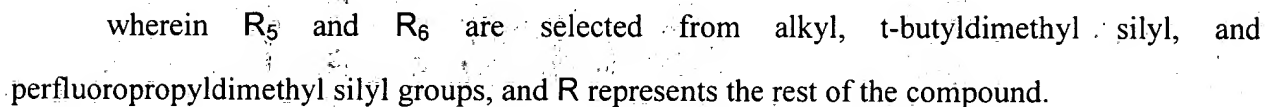
20. (New) The compound of Claim 9, wherein the π -conjugated polyene bridge comprises a dihydrofuran group having the structure:



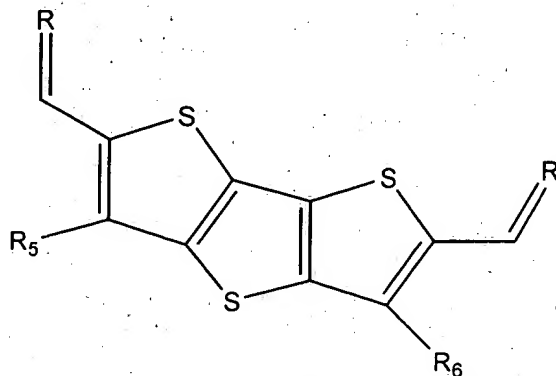
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1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

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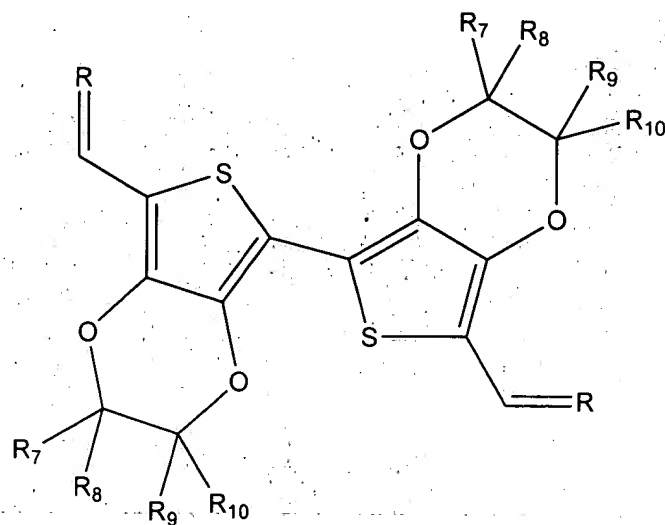
23. (New) The compound of Claim 9, wherein the π -conjugated polyene bridge comprises a fused trithiophene group.
24. (New) The compound of Claim 9, wherein the π -conjugated polyene bridge comprises a fused trithiophene group having the structure:



wherein R_5 and R_6 are alkyl groups, and R represents the rest of the compound.

25. (New) The compound of Claim 9, wherein the π -conjugated polyene bridge comprises a dithiophene group.

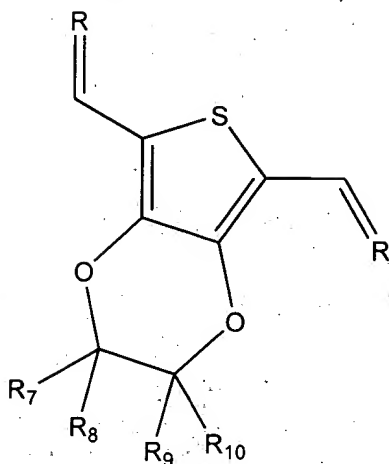
26. (New) The compound of Claim 9, wherein the π -conjugated polyene bridge comprises a dithiophene group having the structure:



wherein R_7 , R_8 , R_9 , and R_{10} are independently selected from hydrogen, alkyl, fluorine, and trimethylfluoro groups; and R represents the rest of the compound.

27. (New) The compound of Claim 9, wherein the π -conjugated polyene bridge comprises a substituted thiophene group.

28. (New) The compound of Claim 9, wherein the π -conjugated polyene bridge comprises a substituted thiophene group having the structure:

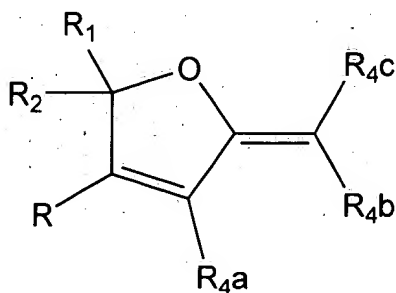


wherein R_7 , R_8 , R_9 , and R_{10} are independently selected from hydrogen, alkyl, fluorine, and trimethylfluoro groups; and R represents the rest of the compound.

29. (New) A compound, comprising a π -electron donor conjugated to a π -electron acceptor through a π -conjugated polyene bridge, wherein the bridge comprises a fused dithiophene group.

30. (New) A compound, comprising a π -electron donor conjugated to a π -electron acceptor through a π -conjugated polyene bridge, wherein the bridge comprises a fused trithiophene group.

31. (New) A compound, comprising a π -electron donor conjugated to a π -electron acceptor through a π -conjugated polyene bridge, wherein the acceptor comprises a furan group having the structure:



wherein R₁ and R₂ are alkyl groups, R_{4a}, R_{4b}, and R_{4c} are independently selected from F, CN, CF₃, and CF₃SO₂, provided that R_{4a}, R_{4b}, and R_{4c} are not all CN, and R represents the rest of the compound.

32. (New) The compound of Claim 31, wherein R_{4a}, R_{4b}, and R_{4c} are independently selected from F, CF₃, and CF₃SO₂.

33. (New) The compound of Claim 31, wherein R_{4a} is CN, R_{4b} is CN, and R_{4c} is CF₃SO₂.

34. (New) The compound of Claim 31, wherein R_{4a} is CF₃SO₂, R_{4b} is CN, and R_{4c} is CF₃SO₂.

35. (New) A macromolecular structure, comprising the compound of Claim 9.

36. (New) The macromolecular structure of Claim 35, wherein the structure is a dendrimer.

37. (New) The macromolecular structure of Claim 36, wherein the dendrimer comprises a crosslinkable dendrimer.

38. (New) The macromolecular structure of Claim 35, wherein the structure is a polymer.

39. (New) The macromolecular structure of Claim 38, wherein the polymer comprises a crosslinkable polymer.

40. (New) A macromolecular structure, comprising the compound of Claim 29.

41. (New) The macromolecular structure of Claim 40, wherein the structure is a dendrimer.

42. (New) The macromolecular structure of Claim 41, wherein the dendrimer comprises a crosslinkable dendrimer.

43. (New) The macromolecular structure of Claim 40, wherein the structure is a polymer.

44. (New) The macromolecular structure of Claim 43, wherein the polymer comprises a crosslinkable polymer.

45. (New) A macromolecular structure, comprising the compound of Claim 30.

46. (New) The macromolecular structure of Claim 45, wherein the structure is a dendrimer.

47. (New) The macromolecular structure of Claim 46, wherein the dendrimer comprises a crosslinkable dendrimer.

48. (New) The macromolecular structure of Claim 45, wherein the structure is a polymer.

49. (New) The macromolecular structure of Claim 48, wherein the polymer comprises a crosslinkable polymer.

50. (New) A macromolecular structure, comprising the compound of Claim 31.

51. (New) The macromolecular structure of Claim 50, wherein the structure is a dendrimer.

52. (New) The macromolecular structure of Claim 51, wherein the dendrimer comprises a crosslinkable dendrimer.

53. (New) The macromolecular structure of Claim 50, wherein the structure is a polymer.

54. (New) The macromolecular structure of Claim 53, wherein the polymer comprises a crosslinkable polymer.

55. (New) A nonlinear optical device, comprising an active element including the compound of Claim 9.

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56. (New) A nonlinear optical device, comprising an active element including the compound of Claim 29.

57. (New) A nonlinear optical device, comprising an active element including the compound of Claim 30.

58. (New) A nonlinear optical device, comprising an active element including the compound of Claim 31.

59. (New) A dendrimer, comprising a chromophore having a π -electron donor conjugated to a π -electron acceptor through a π -conjugated polyene bridge, wherein the bridge comprises a thiophene group.

60. (New) A dendrimer, comprising a chromophore having a π -electron donor conjugated to a π -electron acceptor through a π -conjugated polyene bridge, wherein the bridge comprises a bithiophene group.

61. (New) A dendrimer, comprising a chromophore having a π -electron donor conjugated to a π -electron acceptor through a π -conjugated polyene bridge, wherein the bridge comprises a fused dithiophene group.

62. (New) A dendrimer, comprising a chromophore having a π -electron donor conjugated to a π -electron acceptor through a π -conjugated polyene bridge, wherein the bridge comprises a fused trithiophene group.

63. (New) A dendrimer, comprising a chromophore having a π -electron donor conjugated to a π -electron acceptor through a π -conjugated polyene bridge, wherein the acceptor comprises a furan group.

64. (New) A dendrimer, comprising the compound of Claim 1.